

1. A surgical instrument comprising:
  - a nozzle that is shaped to form a liquid jet;
  - a pressure lumen configured and positioned to convey a flow of liquid to the nozzle;
  - 5 an evacuation lumen comprising a jet-receiving opening locatable opposite the nozzle to receive at least a portion of the liquid jet emitted from the nozzle, when the instrument is in operation, and which is configured and positioned to convey a flow of liquid away from the jet-receiving opening; and
  - a non-liquid jet tissue-cutting component constructed and positioned to excise
  - 10 tissue during the surgical procedure, wherein
  - the nozzle is positioned, during operation of the instrument, to direct the liquid jet so as to contact tissue excised by the non-fluid jet tissue-cutting component during a surgical procedure.
- 15 2. The surgical instrument of claim 1, wherein the non-liquid jet tissue-cutting component is configured to not rotate, when the instrument is in operation.
3. The surgical instrument of claim 2, wherein the non-liquid jet tissue-cutting component is configured to remain stationary with respect to the position of the
- 20 nozzle.
4. The surgical instrument of claim 2, wherein at least one of the non-liquid jet tissue-cutting component and the nozzle is configured to be longitudinally movable with respect to the other.
- 25 5. The surgical instrument of claim 4, wherein at least a portion of the non-liquid jet tissue-cutting component comprises a sharpened distal end of the evacuation lumen.
- 30 6. The surgical instrument of claim 1, further comprising:
  - a tissue receptacle configured and positioned to contain tissue excised by the tissue-cutting component, wherein the nozzle is positioned, during operation of the instrument, to direct the liquid jet so that at least a portion of the liquid jet is contained within the receptacle.

7. The surgical instrument of claim 6, wherein the tissue receptacle is cup-shaped.

5 8. The surgical instrument of claim 7, wherein at least a portion of the rim of the receptacle is sufficiently sharp to form a tissue-cutting blade comprising the non-liquid jet tissue-cutting component.

9. The surgical instrument of claim 1, wherein the surgical instrument comprises  
10 a device selected from the group consisting of: a curette, a rongeur, a bone punch, bone-cutting forceps, a morcellator, and a surgical micrograsper.

10. The surgical instrument of claim 1, wherein the surgical instrument comprises a curette.

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11. The surgical instrument of claim 1, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 1,000 psig.

12. The surgical instrument of claim 11, wherein the pressure lumen is configured  
20 to enable it to convey a high-pressure liquid at a pressure of at least 2,000 psig.

13. The surgical instrument of claim 12, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 3,000 psig.

25 14. The surgical instrument of claim 13, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 5,000 psig.

15. The surgical instrument of claim 14, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 10,000 psig.

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16. The surgical instrument of claim 15, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 15,000 psig.

17. The surgical instrument of claim 16, wherein the pressure lumen is configured to enable it to convey a high-pressure liquid at a pressure of at least 30,000 psig.

18. The surgical instrument of claim 1, wherein the evacuation lumen includes an expansion in internal diameter at a point defining the location of the entrance of the jet-receiving opening or at a point downstream thereof for enhancing suction at the jet-receiving opening.

19. The surgical instrument of claim 18, wherein the evacuation lumen includes a region of reduced internal diameter located downstream of the jet-receiving opening and an expansion of the internal diameter adjacent to and downstream of said region of reduced internal diameter.

20. The surgical instrument of claim 1, wherein the evacuation lumen is shaped and positioned to enable it to remove from a surgical site at least a portion of tissue excised by the tissue-cutting component during operation.

21. The surgical instrument of claim 1, further comprising:  
a distal end adapted to perform a surgical procedure on a patient,  
wherein the distal end of the surgical instrument has a shape and size selected to facilitate insertion of the distal end into a region of the body of the patient defining a surgical site.

22. The surgical instrument of claim 21, wherein the region of the body of the patient defining a surgical site is the spine of the patient.

23. The surgical instrument of claim 1, further comprising:  
a distal end adapted to perform a surgical procedure on a patient; and  
a proximal end adapted to facilitate control of the instrument by an operator,  
wherein the distal end of the surgical instrument comprises the non-liquid jet tissue-cutting component, and  
wherein the proximal end of the instrument is configured to be grasped and/or manipulated by an operator, the proximal end being operatively coupled to the non-liquid jet tissue-cutting component of the distal end to facilitate control and actuation

of the non-liquid jet tissue-cutting component by manipulation of the proximal end by the operator.

24. The surgical instrument of claim 1, wherein the evacuation lumen is shaped and positionable to enable evacuation of essentially all of the liquid comprising the liquid jet from the jet-receiving opening to a proximal end of the instrument, without the need for an external source of suction.

25. The surgical instrument of claim 1, further comprising:  
a proximal end adapted to facilitate control of the instrument by an operator;  
and  
a handle at the proximal end of the instrument.

26. The surgical instrument of claim 25, wherein the handle comprises a grasping region shaped and positioned to facilitate gripping by a hand of an operator of the instrument.

27. The surgical instrument of claim 25, wherein at least a first portion of the handle is movable with respect to a second portion of the handle.

28. The surgical instrument of claim 26, wherein the handle is configured and coupled to the non-liquid jet tissue-cutting component such that the non-liquid jet tissue-cutting component can excise tissue from the patient when the first portion of the handle is moved with respect to the second portion of the handle.

29. The surgical instrument of claim 1, wherein the non-liquid jet tissue-cutting component comprises a mechanical cutter.

30. The surgical instrument of claim 29, wherein the mechanical cutter comprises a sharpened blade.

31. The surgical instrument of claim 1, wherein a distance separating the jet-receiving opening of the evacuation lumen from the nozzle defines a length of the liquid jet emitted from the nozzle.

32. The surgical instrument of claim 31, wherein the longitudinal position of at least one of the jet-receiving opening of the evacuation lumen and the nozzle with respect to the non-liquid jet tissue-cutting component is adjustable by an operator of the instrument.

33. The surgical instrument of claim 32, wherein both the jet-receiving opening of the evacuation lumen and the nozzle are longitudinally movable with respect to the non-liquid jet tissue-cutting component.

34. The surgical instrument of claim 33, wherein the jet-receiving opening of the evacuation lumen and the nozzle are longitudinally movable with respect to the non-liquid jet tissue-cutting component in fixed relation to each other such that the length of the liquid jet does not change upon adjustment of the relative longitudinal position of the jet-receiving opening of the evacuation lumen and the nozzle with respect to the non-liquid jet tissue-cutting component.

35. The surgical instrument of claim 31, wherein a distance separating the jet-receiving opening of the evacuation lumen from the nozzle is adjustable by an operator of the instrument.

36. The surgical instrument of claim 32, wherein the distance separating the jet-receiving opening of the evacuation tube from the nozzle is adjustable by manipulating at least a portion of a proximal end of the instrument.

37. The surgical instrument of claim 31, wherein at least one of the pressure lumen and the evacuation lumen is movable relative to the other.

38. The surgical instrument of claim 37, wherein movement of at least one of the pressure lumen and the evacuation lumen causes a change in the length of the liquid jet emitted from the nozzle.

39. A kit comprising the surgical instrument of claim 1, in combination with instructions directing an operator to dispose of at least a portion of the instrument after a single use.

5 40. The kit of claim 39, wherein the instructions direct an operator to dispose of only a portion of the instrument after a single use and to reuse the remainder of the instrument.

41. The kit of claim 40, wherein the instructions direct an operator to dispose of at  
10 least one of the pressure lumen, the evacuation lumen, the nozzle, and the non-liquid jet tissue cutting component.

42. The kit of claim 39, wherein the instructions direct an operator to dispose of the entire instrument after a single use.

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43. The surgical instrument of claim 1, further comprising:  
a distal end adapted to perform a surgical procedure on a patient,  
wherein the nozzle is positioned at the distal end of the instrument and is  
configured such that the liquid jet emitted by the nozzle and directed so as to contact  
20 the tissue excised by the non-fluid jet tissue-cutting component is able to cut at least a  
portion of the excised tissue and/or drive at least a portion of the excised tissue into  
and at least partially through the evacuation lumen.

44. A surgical instrument comprising:

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a nozzle that is shaped to form a liquid jet;  
a pressure lumen configured and positioned to convey a flow of liquid to the  
nozzle;

an evacuation lumen comprising a jet-receiving opening locatable opposite the  
nozzle to receive at least a portion of the liquid jet emitted from the nozzle, when the  
30 instrument is in operation, and which is configured and positioned to convey a flow of  
liquid away from the jet-receiving opening; and

a non-liquid jet, non-rotating tissue-cutting component constructed and  
positioned to excise tissue during the surgical procedure.

45. The surgical instrument of claim 44, further comprising:  
a tissue receptacle configured and positioned to contain tissue excised by the  
non-liquid jet, non-rotating tissue-cutting component, wherein the nozzle is  
positioned, during operation of the instrument, to direct the liquid jet so that at least a  
5 portion of the liquid jet is contained within the receptacle.
46. The surgical instrument of claim 45, wherein the tissue receptacle is cup-  
shaped.
- 10 47. The surgical instrument of claim 44 , wherein the pressure lumen is configured  
to enable it to convey a high-pressure liquid at a pressure of at least 1,000 psig.
48. The surgical instrument of claim 44, wherein the evacuation lumen is shaped  
and positioned to enable it to remove from a surgical site at least a portion of tissue  
15 excised by the non-liquid jet, non-rotating tissue-cutting component during operation.
49. The surgical instrument of claim 44, wherein the evacuation lumen is shaped  
and positionable to enable evacuation of essentially all of the liquid comprising the  
liquid jet from the jet-receiving opening to a proximal end of the instrument, without  
20 the need for an external source of suction.
50. The surgical instrument of claim 44, further comprising:  
a distal end adapted to perform a surgical procedure on a patient,  
wherein the distal end of the surgical instrument has a shape and size selected  
25 to facilitate insertion of the distal end into a region of the body of the patient defining  
a surgical site.
51. The surgical instrument of claim 50, wherein the region of the body of the  
patient defining a surgical site is the spine of the patient.
- 30 52. The surgical instrument of claim 44, wherein the surgical instrument  
comprises a device selected from the group consisting of: a curette, a rongeur, a bone  
punch, bone-cutting forceps, a morcellator, and a surgical micrograsper.

53. The surgical instrument of claim 44, wherein the surgical instrument comprises a curette.

54. The surgical instrument of claim 44, further comprising:

5 a distal end adapted to perform a surgical procedure on a patient and a proximal end adapted to facilitate control of the instrument by an operator, wherein the distal end of the surgical instrument comprises the non-liquid jet, non-rotating tissue-cutting component, and wherein the proximal end of the instrument is configured to be grasped and/or manipulated by an operator, the proximal end being operatively coupled to the non-liquid jet, non-rotating tissue-cutting component of the distal end to facilitate control and actuation of the non-liquid jet, non-rotating tissue-cutting component by manipulation of the proximal end by the operator.

15 55. A surgical instrument comprising:

a non-liquid jet tissue-cutting component constructed and positioned to excise tissue during a surgical procedure;

a tissue receptacle configured and positioned to contain tissue excised by the tissue-cutting component;

20 a nozzle that is shaped to form a liquid jet and is positioned to direct the liquid jet so that at least a portion of the liquid jet is contained within the receptacle, when the instrument is in operation; and

a pressure lumen configured and positioned to convey a flow of liquid to the nozzle.

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56. The surgical instrument of claim 55, wherein the tissue receptacle is cup-shaped.

57. The surgical instrument of claim 56, further comprising:

30 a distal end adapted to perform a surgical procedure on a patient, wherein the receptacle is positioned at the distal end of the instrument and comprises a rim, at least a portion of said rim being configured and positioned to provide a sharpened cutting blade defining the non-liquid jet tissue-cutting component constructed and positioned to excise tissue during the surgical procedure.



58. The surgical instrument of claim 55, wherein the surgical instrument comprises a device selected from the group consisting of: a curette, a rongeur, a bone punch, bone-cutting forceps, a morcellator, and a surgical micrograsper.

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59. The surgical instrument of claim 55, wherein the surgical instrument comprises a curette.

60. The surgical instrument of claim 55, wherein at least an outlet portion of the nozzle is contained within the receptacle.

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61. The surgical instrument of claim 60, wherein longitudinal position of the outlet portion of the nozzle within the receptacle is adjustable by an operator of the instrument.

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62. A surgical instrument comprising:  
a cup-shaped tissue receptacle configured and positioned to contain tissue;  
a nozzle that is shaped to form a liquid jet and is positioned to direct the liquid jet so that at least a portion of the liquid jet is contained within the receptacle, when the instrument is in operation; and  
a pressure lumen configured and positioned to convey a flow of liquid to the nozzle.

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63. The surgical instrument of claim 62, further comprising:  
a distal end adapted to perform a surgical procedure on a patient, wherein the receptacle is positioned at the distal end of the instrument and comprises a rim defining a tissue-contacting periphery thereof.

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64. The surgical instrument of claim 63, wherein the rim of the receptacle is not sharpened to provide a tissue-cutting edge.

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65. The surgical instrument of claim 63, wherein the rim of the receptacle is sharpened to provide a tissue-cutting edge.

66. The surgical instrument of claim 62, wherein the surgical instrument comprises a curette.

67. A method of performing a surgical procedure on a patient comprising:  
5       applying a surgical instrument to a surgical site of the patient;  
          excising a piece of tissue from the patient with a non-liquid jet tissue-cutting  
component of the surgical instrument; and  
          directing a liquid jet associated with the surgical instrument towards the piece  
of tissue excised in the excising step so that the liquid jet impacts the piece of tissue.

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68. A surgical instrument comprising:  
          a curette device comprising: a nozzle that is shaped to form a liquid jet and a  
pressure lumen configured and positioned to convey a flow of liquid to the nozzle.

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69. The surgical instrument of claim 68, wherein the curette device further  
comprises:  
          an evacuation lumen comprising a jet-receiving opening locatable opposite the  
nozzle to receive at least a portion of the liquid jet emitted from the nozzle, when the  
20 instrument is in operation, and which is configured and positioned to convey a flow of  
liquid away from the jet-receiving opening.

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70. A method of performing a surgical procedure on a patient comprising:  
          applying a curette to a surgical site of the patient; and  
25       creating a liquid jet associated with the curette.

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71. A surgical instrument comprising:  
          a distal end of the instrument adapted to perform a surgical procedure on a  
patient and comprising a tissue manipulating component configured and positioned to  
30 manipulate a tissue of the patient;

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          a proximal end of the instrument having at least a portion thereof configured  
to be grasped and/or manipulated by an operator, said portion of the proximal end  
being operatively coupled to the tissue manipulating component of the distal end to  
facilitate control and actuation of the tissue manipulating component from a non-

manipulating configuration to a manipulating configuration by manipulation of said portion of the proximal end by the operator;

a nozzle that is shaped to form a liquid jet; and

5 a pressure lumen configured and positioned to convey a flow of liquid to the nozzle, wherein

the nozzle is constructed positioned, during operation of the instrument, to direct the liquid jet to fragment and/or disaggregate and/or cut of at least some tissue manipulated by the manipulating component.

10 72. The surgical instrument of claim 71, wherein

the nozzle is positioned at the distal end of the instrument and is constructed positioned, during operation of the instrument, to direct the liquid jet so that it impacts tissue manipulated by the manipulating component.

15 73. The surgical instrument of claim 71, wherein

the surgical instrument comprises a liquid jet-driven rotor operatively coupled to a rotatable tissue contacting component located at the distal end of the instrument, the rotatable tissue contacting component being configured to fragment and/or disaggregate and/or cut tissue upon rotation, and wherein

20 the nozzle is constructed positioned to direct, during operation of the instrument, the liquid jet to impact the liquid jet-driven rotor and drive rotation of the rotatable tissue contacting component.

74. A surgical instrument comprising:

25 a distal end adapted to perform a surgical procedure on a patient and a proximal end adapted to facilitate control of the instrument by an operator;

a rotatable tissue-contacting component constructed and arranged for contact with tissue in a surgical operating field and located at the distal end;

a nozzle that is shaped to form a liquid jet;

30 a pressure lumen configured and positioned to convey a flow of liquid to the nozzle;

a liquid jet-driven rotor configured and positioned with respect to the nozzle to be drivable in rotation by the liquid jet formed by the nozzle and operatively coupled to the rotatable tissue-contacting component, when the instrument is in operation,

such that rotation of the liquid jet-driven rotor causes rotation of the rotatable tissue-contacting component, wherein

at least one of the rotatable tissue-contacting component and a distal-most end of the surgical instrument is longitudinally movable relative to the other upon

5 manipulation of at least a portion of the proximal end of the instrument by the operator.